Asset Management
Manual of Instruction

We're Shaping Utah's Transportation Future Today

UDOT Connecting Communities
ASSET MANAGEMENT

Utah Department of Transportation

Asset Management Overview

UDOT's transportation environment is characterized by challenges to efficiently manage budgets in order to maintain our transportation system. The combination of changes in the transportation environment and public expectations has created a strong motivation for aligning our business practices with asset management principles.

A still-maturing concept in the highway industry, asset management may be defined as a "systematic process of maintaining, upgrading and operating physical assets cost-effectively." It combines engineering, economic principles and sound business practices to support decision-making at the network, project and field/operational level. Thus, asset management provides a framework for handling both short- and long-range planning.

Asset management links user expectations for system condition, performance, and availability with system management and investment strategies. This broad approach to resource allocation and programming decisions can provide greater value to the system and overall satisfaction for end-users. Asset management not only aids in the decision-making process, but also facilitates a fact-based dialogue between system users and other stakeholders, government officials, and managers concerned with day-to-day operations. Asset management can provide ready access to quantitative and qualitative data allowing decision-makers to more readily identify and focus on key issues.

The Federal Highway Administration (FHWA), American Association of State Highway and Transportation Officials (AASHTO) and the National Cooperative Highway Research Program (NCHRP) have sponsored numerous studies of asset management experience, techniques and processes both here and abroad. In these studies it as been noted that asset management, as an organizational culture and decision-making process, is critical to transportation programs facing significant capital renewal and preservation needs and that successful programs require top-level commitment.

Transportation asset management encompasses all phases of infrastructure life including public policy, planning, maintenance, preservation and rehabilitation. The key components to any comprehensive asset management system include the following:

1) goals and policies;
2) asset inventory;
3) condition assessment and performance monitoring;
4) a process to determine short- and long-term needs; and
5) methods to evaluate the strategies employed.

Although each element is essential, the key building blocks for any asset management system are a comprehensive inventory and condition rating for assets.

The data may be used for various purposes: planning, budgeting, scheduling and performance evaluation. Data collection requirements should be compatible with the intended use of the data. Asset management data collection should support the decision-making processes of the intended user. Asset management principles can be applied to each level of the management, operation and analysis of transportation assets. Similarly, data collection requirements must reflect how the data will be used at the network, project and field/operational level. The network level may be used to determine the overall scope of an agency's needs and may allow for general budget allocations. The focus is narrowed when applied to project level, where emphasis is placed on a geographic region and used to develop and overall work plan for meeting performance measures. The field/operational level is intended to provide tools to optimize the actual work accomplished. To ensure that appropriate data will be collected, critical thought must be given to how the data will be used.

In general, asset data collection is categorized as follows: 1) location; 2) physical attribute; and 3) condition. Physical attributes collected vary from asset to asset. General attributes that are consistent across assets include material type, size and length. Condition assessment is dependent upon the specified performance criteria for the asset. Data can be broad for some assets requiring a qualitative rating of only "good," "fair," or "poor," whereas others may require a more detailed approach set forth by national or regionally accepted practices or standards.

UDOT's asset management system currently includes pavements, structures and safety, all of which are categorized as noted above. The following MOI outlines a timeline for collection of data, the details of data collection, when the data is added to the asset management system and how the data is manipulated, using the software provided by Deighton and Associates (dTIMS). The manual also includes a general time line UDOT uses to develop the overall budget and projects. The Asset Management data acquisition and analysis timeline shown in this MOI demonstrates the importance of analyzing current, accurate data so that senior management as well as each region within UDOT has access to up to date data analysis in order to develop the STIP and insure monies are spent in the most effective manner.

UDOT Asset Management Timeline

In order to provide UDOT regions & UDOT's Asset Management Director with the data necessary to assist each region with their STIP workshops (**held in January**) and the Asset Management Director with a matrix of budget scenarios (based upon funding scenarios) that will be presented to the Transportation Commission and Legislature throughout the month of **February**, the following is a timeline for collecting and entering data into the dTIMS model for pavements, structures and safety.

The **Utah Transportation Commission** is a seven-member commission whose members are appointed by the Governor with advice and consent of the Senate. Six of the members are selected to represent specific areas of the state, and one member represents the state at large. Duties of the commission are to determine priorities and funding, location and establishment of state highways and airports, hold public meetings and provide for public involvement in transportation matters, make rules on behalf of UDOT, and advise the department on statewide transportation policy.

The Department provides to the Transportation Commission during the April Workshop project recommendations that they either accept, reject or modify. The Commission votes on the recommendation during the April or May Commission Meeting. The list of new projects is sent out for public comment and progresses though the process on through FHWA/FTA approval. Then the STIP (list of new projects) is approved and becomes the Departments new work plan.

March/April: dTIMS pavement engineer holds and conducts "working group" meetings with the region PME's in order to refine the pavement model. The objective of these meetings is to update and gain consensus on cost data used for the various treatments modeled in dTIMS as well as discuss any improvements to the dTIMS pavement model. The Asset Manager Engineer conducts meetings with the Structures group during this same time period to update and gain consensus on cost data for structures treatments in dTIMS & to make any improvements to the dTIMS structure model. The Asset Manager Engineer also meets with the Traffic & Safety group to go update the data and make any changes to the dTIMS model as it relates to safety data used in the model.

May: Asset Management field meetings with each region. These bi-annual meetings (May & November) are scheduled by the Asset Manager Director and involve updating the regions on the dTIMS pavement and structure model. It is also intended to provide a closer working relationship between the regions and the asset management group.

June/July: Pavement engineer and asset management engineer prepare data for the Interim Transportation Committee meetings.

August: Current pavement year data collection completed by vendor and uploaded into dTIMS models by the asset pavement engineer. Asset manager engineer uploads current structure data into dTIMS as well as the current safety data provided by Traffic &

safety.

September/October: The various dTIMS model runs (using the new data) for pavements, structures and safety are run and compiled as requested by the Asset Management Director. This data is provided to the regions for their upcoming STIP workshops.

Beginning in October, **the Orange Book Allocation Process** begins for the following fiscal year, which starts the next July 1st. A detailed time line process for Orange Book projects is included later in this document.

November: Asset Management field meetings with each region. These bi-annual meetings are scheduled by the Asset Manager Director and involve updating the regions on the dTIMS pavement and structure model. They are also intended to provide a closer working relationship between the regions and the asset management group through a discussion of current model output vs. what the region's PME observe in the field in order to improve the dTIMS model and answer questions posed by the region's PME's.

December: The Pavement Management Engineer submits the Orange Book splits for the regions to central Maintenance by the first week in December. Maintenance needs this information so that Maintenance can generate and send a letter to all the regions, asking each region to nominate their highest priority projects. Each region is responsible to respond by the end of January.

Specific dTIMS model instructions for Pavements, Structures & Safety

1.0 Asset Groups configure models and advise Asset Management Team of changes

1.1 Print out latest cost expressions for the structures division and let them review them. Cost expressions for structures are named "ancCST_STRxyz". To do this, open up the expressions list. For all expressions you want to print, right click on the expression name, then click "print".

1.2 Regions transfer data to Statistics/Data

1.3 Statistics/Data transfers data to PMS (for previous 2 years)

1.4 Pavement transfers data to Asset Management System

1.5 Traffic & Safety transfers data to Safety Management System (SMS)

The Safety Management System (SMS) is a database application used by the Utah Department of Transportation (UDOT) for the entry, storage, retrieval, and analysis of crashes within the State of Utah. The SMS contains a record of every crash within the State of Utah. Crashes are entered into SMS two different ways: 1) By manual entry from a paper crash report sent in by law enforcement; and 2) By electronic submittal. Several of the largest law enforcement agencies within the State, including the Utah Highway Patrol, use electronic submittal as their method of reporting a crash. Staff members of the Crash Studies Team, Traffic & Safety Division, verify each crash report for accuracy and completeness and assign a physical location, preferably by route and milepoint, to the crash. We process approximately 65,000 crash reports annually.

1.6 Structures transfer data to PONTIS

How is information populated into the Pontis Database?
The bridge inventory database application, Pontis, is populated through information obtained during visual inspections of Structures and their individual elements. An image of the database dealing with the structures to be inspected is downloaded onto laptop computers prior to going out into the field. Once in the field, the data is entered directly into the image of the database on the laptops by the inspection team at the time of visual inspections. The information gathered in the field is then uploaded into the main database once back in the office. The database is now updated with the new inspection data and a hard copy of a summary for each structure is printed out and kept in a folder with the history of the structure.

2.0 Asset Management Team transfers data to Asset Management System

NOTE: Tasks in MS Excel = green, Tasks in dTIMS = blue

2.1 AADT Data

2.1.1 Request the latest "AADT History" file from Lee Theobald (Traffic Statistics)

2.1.2 Prepare import file: Open the MS Excel file that was sent and sort the rows of the TOUH file by route and beginning milepoint (Bmp), which will remove empty rows between routes. Change the first header names to "Road", "From", and "To". Perform an ascending sort based on road first, then milepoint. Delete all rows for roads greater than 491 (delete data for non-state roads). Add a "P" to the end of each route name so that it looks like "0006P" through "0491P". Now copy the divided route (15, 70, 80, 84, 215) data to the bottom and change the direction from "P" to "N".

Add dTIMS columns: Add "ElementID" and "Rejected" columns as follows:

ElementID	Road	Rejected	From	To	Description	2004	2003
	0006P		0.00	46.02	NEVADA STATE LINE	320	315
	0006P		46.02	77.55	ROAD LEFT TO ANTELOPE SPRINGS	320	315
	0006P		77.55	81.88	ROAD RIGHT TO GUNNISON MASSACRE SITE	320	315
	0006P		81.88	82.38	WEST INCL HINCKLEY	590	520

Populate dTIMS columns: Populate the "ElementID" column from '0001' through '2167', or whatever the final value is. Be sure to use the preceding zeros and use text rather than numerical format for the 4-character ElementID. Populate the "Rejected" column with FALSE all the way down to the last row of data.

ElementID	Road	Rejected	From	To	Description	2004	2003
0001	0006P	FALSE	0.00	46.02	NEVADA STATE LINE	320	315
0002	0006P	FALSE	46.02	77.55	ROAD LEFT TO ANTELOPE SPRINGS	320	315
0003	0006P	FALSE	77.55	81.88	ROAD RIGHT TO GUNNISON MASSACRE SITE	320	315
0004	0006P	FALSE	81.88	82.38	WEST INCL HINCKLEY	590	520

Named Ranges: Select the first five columns of data and name the range (insert→name→define) as "elements". Then, select all columns of data (do not accidentally select blank rows at the bottom or blank columns to the left) and name that range as "all". Save, name, and close the file.

Change descriptions: Open the database file in dTIMS-CT Enterprise. Go to "Attributes", "Perspectives", and "Data Views" and change the descriptions for all mobility objects to reflect the year of data that you are importing. For example if the perspective is titled "Mobility_AADT", right click on properties and change the description from "2003 AADT" to "2004 AADT". Everywhere a year appears in the names or descriptions for the mobility attributes, perspectives, or data views, change the year to the correct year.

Delete old mobility elements: Open the database file in dTIMS-CT Enterprise and execute the perspective called "Mobility_AADT". Maximize the yellow screen and hit (edit→remove) all elements. Use the "none" filter when removing the elements. Now use (file→import) and choose the import file that you prepared. This will generate errors in the import file due to location referencing problems.

Generate import file errors: Hit (file→import) and choose the import file that you prepared. This will generate errors in the import file due to location referencing problems. Close the perspective and open up the "Roads" perspective. Maximize the yellow screen and hit (file→ export). Name the file as "Roads" and export the file as MS Excel file type.

Repair import file: Open up the import file and find the rows where the "Rejected" column has changed from FALSE to TRUE. These are rows that need to be fixed

because of location problems. Now open up the "Roads.xls" export file. Toggle back and forth between the "Roads.xls" file and the import file and repair the segment "From" and "To" locations in the import file. The "Roads.xls" file will tell you where the road segments begin and end, which will assist you in repairing the locations in the import file.

Import Elements: Hit "edit→remove all elements". When prompted, choose the "none" option and hit "ok". Now hit "file→import" and Open the "Mobility_AADT" perspective and choose "file→import". When prompted for the desired table, choose "elements", which is the first four columns.

Create new attribute: Close the perspective and open up "attributes". Go to the latest "MOBLILITY_AADT" attributes and add the new year attribute by copying and pasting one of the other years and renaming it as the new year. For example, if the new data is for the year 2005, copy the "MOBILITY_AADT→AADT2004" attribute and paste it. Change the name and the description to reflect the year 2005.

Modify the data view: Close the perspective and open the data view titled "Mobility_AADT". Right click and open "properties". Click on "attributes" in the lower left white window. Click on "Mobility_AADT", and then locate the new attribute you created in the previous step. Double click on that attribute in order to move it to the window on the right side. Hit "OK" to close the data view properties window.

Import data: Click on file→import then choose the import file. Select the "all" table and supply an error file name in order to import the data.

2.2 Safety Data

2.2.1 Request the following safety data from Traffic & Safety (current contact W. Scott Jones) for the latest year:

Route	From	Severity	Year
6	9.82	3	2004

2.2.2 Prepare import file: You will need to follow these eight steps in order to prepare the import file for dTIMS. In these steps you will begin with a raw *.txt file and end up with an MS Excel import file.

Create MS Excel file: The data will be sent to you in *.txt format. Right click on the file and click "open with Excel". Move the column containing the year (probably the first column) to the end. Insert two columns titled "ElementID" and "Rejected" (for use in dTIMS) at the beginning and re-label the columns as follows: (Route→Road), (Milepoint→From), (acc_severity_cd→Severity), and (Year→Data_Year). Delete the column labeled "location_cd". Now it should look like this:

Road	From	Severity	Data_Year
6	230.14	1	2004
6	224.64	1	2004
6	181.64	2	2004

Delete non-state roads: Perform an ascending sort based on road first, then milepoint. Delete all rows for roads greater than 491 and less than 6 (delete data for non-state roads).

Populate ElementID and Rejected: Add one column to the right of "Route" and add one columns to the right of "From". Label them as follows:

Route	Road	From	ElementID	Severity	Data_Year
6		230.14		1	2004
6		224.64		1	2004
6		181.64		2	2004

Populate the "ElementID" column from '00001' to '32452', or whatever the final value is. Populate the "Road" column using the formula =0&(RIGHT(1000+A2,3))&"P" as follows:

Route	Road	From	ElementID	Severity	Data_Year
6	0006P	9.57	00001	4	2002
6	0006P	25.53	00002	1	2002
6	0006P	25.53	00003	4	2002

Now, copy and paste the "Road" column back on top of itself. Move "ElementID" to the first column, create a "Rejected" column full of "FALSE" values, and then delete the "Route" column as follows:

ElementID	Road	From	Rejected	Severity	Data_Year
00001	0006P	9.57	FALSE	4	2002
00002	0006P	25.53	FALSE	1	2002

Analysis Columns: Insert two more columns called "Crashes", and "Num4or5" accordingly:

ElementID	Road	From	Rejected	Crashes	Severity	Num4or5	Data_Year
00001	0006P	9.57	FALSE		4		2002
00002	0006P	25.53	FALSE		1		2002
00003	0006P	25.53	FALSE		4		2002

Populate the "Crashes" column with the number 1 (because there is one crash at each location). In order to populate the "Num4or5" column make is the "If Then" statement: "=IF (F2>3,1,0)" which means, "If the severity is more than 3, make a 1, otherwise make a 0".

The import file now looks like this:

ElementID	Road	From	Rejected	Crashes	Severity	Num4or5	Data_Year
00001	0006P	9.57	FALSE	1	4	1	2002
00002	0006P	25.53	FALSE	1	1	0	2002
00003	0006P	25.53	FALSE	1	4	1	2002

Named Ranges: Select the first four columns of data and name the range (insert→name→define) as "elements". Then, select all 11 columns of data (do not accidentally select blank rows at the bottom or blank columns to the left) and name that range as "all". Save and close the file.

Change descriptions: Open the database file in dTIMS-CT Enterprise. Go to "Attributes", "Perspectives", and "Data Views" and change the descriptions for all safety objects of the oldest year to reflect the new data year. For example if "Safety2_Crashes" pertains to the oldest year of data, then change the description from "2001 crashes" to "2004 crashes". Everywhere a year appears in the description, change the year to the newest year. The following table shows how the 1,2 or 3 designators should line up with the actual analysis years:

For example: In 2005, the latest year of safety data was for 2003

	Designator		
Actual Year	"1"	"2"	"3"
2005	2001	2002	2003
2006	2004	2002	2003
2007	2004	2005	2003
2008	2004	2005	2006
2009	2007	2005	2006

Notes: 1) The purpose for assigning the designators like this is to reduce the workload. Only one year of data needs to be modified by using this system. 2) This table will change if Traffic & Safety speeds up their data processes.

Generate import file errors: Open the database file in dTIMS-CT Enterprise and execute the perspective called "SAFETY(1,2or3)_CRASHES". Remember to only override the oldest year (which will be designated in dTIMS with either 1, 2,or 3), with the newest

year of data and change the descriptions to reflect the new data year. Maximize the yellow screen and hit (edit→remove) all elements. Use the "none" filter when removing the elements. Now use (file→import) and choose the import file that you prepared. This will generate errors in the import file due to location referencing problems.

Repair import file: Open up the import file and find the rows where the "Rejected" column has changed from FALSE to TRUE. These are rows that need to be fixed because of location problems. Toggle back and forth between the "Roads" perspective in dTIMS and the import file and repair the crash locations (milepoints). The "Roads" perspective will tell you what the actual end of route is, which will assist you in repairing the locations in the import file.

Import Elements: Open the perspective titled "SAFETY(1,2or3)_CRASHES. Hit (file→import) and choose the import file. When prompted for the desired table, choose "elements", which is the first four columns.

Import Data: Close the perspective and open the data view titled SAFETY(1,2or3)_CRASHES. Be sure to choose the correct data view (oldest year) that you are overriding with the new year of data. Hit (file→import) and choose the import file. When prompted for the desired table, choose "all", which is all the data.

Modify Transformations: Click "Perspective Transformations". Right click and open the properties of "SAFETY_AADT1, 2 and 3" and modify the descriptions to reflect the correct years. Now right click and open the properties of "SAFETY1,2&r3_AADT1,2&3" and make sure the source attribute matches the year that is assigned to the 1,2&3 designators.

Batch Transformations: Click "Transformation Batches". Double Click the "SAFETY(1,2or3)_INDEX transformation batch, which generates the safety index for the new year of data. Next, Double Click the "SAFETY_INDEX" transformation batch, which generates the average safety index for the three latest years of data.

2.3 Structures Data

2.3.1 Request the following structures data file Structures Division:

After receipt of file, change the field names

PONTIS Field Name	PONTIS Field Name	Example
BRKEY	ELEMENTID	005052D
ROUTE	(Same)	A00015
MILEPOINT	(Same)	167.93
COUNTY	(Same)	005
CULVRATING	(Same)	-1
DECK_AREA	(Same)	5.55
DKSURFYPE	DECK_SURF_TYPE	6
DKSTRUCTYP	DECK_TYPE	1
DECKWIDTH	(Same)	10.2
DISTRICT	(Same)	11
DKRATING	(Same)	7
FACILITY	(Same)	COUNTY ROAD
FEATINT	(Same)	HYRUM DAM
FUNCCLASS	FUNC_CLASS	07
LATITUDE	(Same)	413767
LOCATION	(Same)	CITY LIMIT
LONGITUDE	(Same)	1115231
MAINSPANS	(Same)	3
NBI_RATING	NBIRATING	0
LENGTH	STR_LENGTH	15.2
MATERIALMAIN	STR_TYPE	7
MATERIALMAIN	SUP_TYPE	7
FOUNDATION_TYP	SUB_TYPE	S
SUBRATING	(Same)	7
SUFF_RATE	(Same)	73
SUPRATING	(Same)	6
YEARBUILT	YR_BUILT	1935
PAINTED_YEAR	YR_LST_PAINTED	-1

2.3.2 Create structures import file from the raw data. Open the PONTIS export file. Change the column names according to the table above. You will need to add the "SUP_TYPE" column because "MATERIALMAIN" translates to be both "STRUC_TYPE" and "SUP_TYPE".

Sort on each field and look for missing values. For the culvert field, populate blank or "N" cells with a value of –1. To make sure that the entire column is numerical, multiply all values by 1, then replace those values with the numerical values. An extra column will need to be temporarily used for this process.

2.3.3 Change latitude and longitude to decimal degrees: Add five columns next to "Latitude" and five columns next to "Longitude", as shown in the table below. Now use the following formulas to populate the columns:

LATplus.001 = LAT +0.001
LONGplus.001 = LONG +0.001

LATD = LEFT(LATplus.001,2) Degrees
LONGD= LEFT(LONGplus.001,3)

LATM = RIGHT(LEFT(LATplus.001,4),2) Minutes
LONGM =RIGHT(LEFT(LONGplus.001,5),2)

LATS =RIGHT(LATplus.001,6) Seconds
LONGS =RIGHT(V2,6)

LATDD = LATD+(LATM+(LATS/60))/60
LONGDD = –1*(LONGD+(LONGM+(LONG/60))/60)

LAT	LATplus.001	LATD	LATM	LATS	LATDD	LONG	LONGplus.001	LONGD	LONGM	LONGS	LONGDD
403332.5	403332.491	40	33	32.491	40.559025	1115403.87	1115403.871	111	54	03.871	-111.901075
370117.7	370117.701	37	01	17.701	37.021584	1133631.70	1133631.701	113	36	31.701	-113.608806
370119.6	370119.601	37	01	19.601	37.022111	1133632.70	1133632.701	113	36	32.701	-113.609084

2.3.4 Send the file to hange latitude and longitude to decimal degrees: Save the PONTIS export file as "Structures2006", or whatever the data year is and send it to Chris Glazier (GIS specialist) for him to assign route and milepoints to the data.

2.4 Pavement Data

2.4.1 Request the asset management pavement data dump:

3.0 Asset Groups determine budgets needed to achieve goals

4.0 Asset Management Team performs cross asset analysis and determines Asset Group budget splits

5.0 Asset Management Team recommends budget splits to Commission

6.0 Commission approves budget recommendations

7.0 Asset Groups optimize strategies based on approved budgets

8.0 Asset Groups recommend project priorities

9.0 AM Harmonization with Asset Groups

9.1 Check conditions from region pavement analysis sets

Open dtims file for the region.
Highlight the analysis set
Click on "view→data tables->comparison of budget scenarios->avg condition"
Paste table into appropriate region condition spreadsheet to update chart.

9.2 Check budgets from region pavement analysis sets budget scenarios

Open dtims file for the region.
Highlight the analysis set and then the budget scenario
First get the budgets by right clicking on the budget scenario→ properties
(only grab the years of data for the 10-yr window of the current SPP)
Second, get the expenditures by highlighting the budget scenario then clicking on "view->data tables→budget scenario summaries→program costs". Copy and paste the data into the SPP2006_Budgets_Pavements spreadsheet on the appropriate region tab.
To get the statewide budgets and expenditures, simply sum them up from the region charts.

9.3 Check statewide conditions

Start CT Export Wizard
Select region 1 dtims file as source.
Type in username/password.
Name an output database file.
For the screen 2, leave the box unchecked. For screen 3, leave both boxes checked.
Select the correct budget scenario (region1 for example).
Removal all variables.
Add in AADT and OCI then click "Next".
Repeat for all four regions.

10.0 Orange Book Allocation Process

1. Region PMEs update the PFES for their regions. (Oct-Nov) The updates required include any revisions to pavement section limits, updates to construction dates for projects either completed or nearing completion, and treatment costs.

2. Central Pavement Management runs dTIMS using updated PFES and the newest pavement condition data (presumably including distress data from summer and fall of that same year). (Dec 1-15)
   a. Results from dTIMS (1st run, for all segments statewide) determine percentages of the overall available money to go to each Region/District.
   b. Results from dTIMS (2nd run, analyzed one Region/District at a time) used to create a list of potential projects in each Region/District (3 years worth).

3. Cover letter created by Central Maintenance, and distributed about December 15, asking for project nominations from each Region/District by January 31. The dTIMS project list is included as an attachment so that the Region Pavement Management Teams can see what dTIMS is recommending. The project nominations are to be in priority order for each Region/District, without regard for funding source. They should be based on fairly well developed project estimates (not just the values spit out by PFES). The dTIMS recommended projects list is included to help the region teams focus their attention on preventive maintenance projects as opposed to corrective (band-aid) projects. Ideally, the nominations that come from the Regions should match those on the dTIMS list, or at least address locations that appear on the dTIMS 3-year list. In reality, however, that will not be the case, because of imperfections in both the dTIMS models and in the more traditional "engineering judgment" methodology.

4. Region pavement management teams select projects and develop preliminary estimates. (They are not obligated to follow the dTIMS list.) (Dec– Jan)

5. Project nominations received January 31.

6. Based on projects nominated, establish preliminary funding amounts for each Region (Feb 15). Funding amounts are established such that each Region/District's highest priority projects can be funded, taking care to ensure that the total dollar amount recommended by dTIMS for each Region/District is achieved. The program is established by picking from the projects nominated, using the estimates provided, and taking into account the eligibility requirements for the various funding sources. In doing so, both the Region/District totals and the statewide totals for each funding source must balance. The result is a matrix of funding stratified column-wise by Region/District, and row-wise by funding category, as illustrated in this example:

Example:
Assume a total budget of $100, with dTIMS recommending 20% ($20) to Region 1, 30% ($30) to Region 2, 10% ($10) to Region 3, 20% ($20) to Richfield, 10% ($10) to Price, and 10% ($10) to Cedar City. Also assume the available funding consists of $30 IM funds, $20 NHS funds, $4 STP funds, and $46 State funds. Then a possible allocation matrix might look like:

	R-1	***R-2***	***R-3***	***Rich***	***Price***	***Cedar***	***Total***
IM	*12*	*8*		*10*			***30***
NHS	*2*	*4*	*4*		*4*	*6*	***20***
STP		*4*					***4***
State	*6*	*14*	*6*	*10*	*6*	*4*	***46***
Total	***20***	***30***	***10***	***20***	***10***	***10***	***100***

Note that the totals for each Region/District match what was recommended by dTIMS, but that within individual funding categories, there are imbalances. This can occur in most cases without significantly deviating from each Region/District's highest priorities, and while also maintaining the "fairness" of the totals allocated to each Region/District.

7. Central Maintenance sends a memorandum (late Feb) to the Regions/Districts, indicating the funding amounts by funding category, as established above. At this point, the totals are only preliminary, because final funding is not established until the annual Commission Workshop in April.

8. After the Commission Workshop in April, Central Maintenance sends a final memorandum to the Regions/Districts, either confirming the amounts from the preliminary memorandum, or revising them based on any funding changes. At this point, the Regions/Districts are given the go-ahead to manage their own programs within the funding amounts allotted to them (by funding source), and proceed with project development.

9. Project construction may begin on July 1 for state projects. For Federal-Aid projects, the fiscal year won't begin until October 1, but in some years Regions may be allowed to proceed their projects, using Advance Construction funds.